

# ONEIDA NATION OF WISCONSIN

## Contact Information

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## Program Description

### Objectives

The Oneida Tribe's current and future uses of information gathered using bioassessment include protection, restoration, assessing impacts, monitoring changes, as well as driving policy and promoting knowledge and appreciation of aquatic resources.

### Background

Although there had been some invertebrate and fish surveys performed on the Reservation over the last twenty years or so, the development of a formal biological monitoring program was initiated in 2000. Tri-annual fishery surveys at established monitoring sites have been performed since 1997. In 1999, the Tribe began sampling invertebrate communities and immediately began using the findings as tools. An onsite aquatic invertebrate taxonomy laboratory was also established in 1999 and equipped with scopes, literature, drying oven, hood, etc. In 2000, qualitative sampling of invertebrates was performed at five stream sites and a quantitative study of one lake was initiated to determine the effectiveness of BMPs in the surrounding basin. In the meantime, SOPs were developed for qualitative and quantitative methods for lakes and Wadeable Streams and metrics were researched and tested. Contracts were set up for the picking and sorting of invertebrate samples (UW-Superior) and for toxicity testing (Environmental Consulting and Testing) of certain waterbodies. In 2001, quantitative samples were collected at three stream sites and the lake, as well as three more sites being sampled qualitatively. Stream types have not been formalized, but four reference sites have been established:

1. **Thornberry Creek** (at forest Drive), a first order cold water system, exhibiting "pristine" conditions during 1999 and 2000.
2. **Trout Creek** (at County FF), a 3<sup>rd</sup> order cold water system, exhibiting "good" to "very good" conditions.
3. **Oneida Creek** (at VanBoxtel Road), a 3<sup>rd</sup> order cool water system, exhibiting "good" conditions in 2000. A very rare fingernet caddisfly, *Wormaldia moesta*, known to occur only in "small, cold, rapid streams" has been collected at this site.
4. **Duck Creek** (at Seminary Road), a 4<sup>th</sup> order warm water system, the largest stream on the Reservation. The water quality and invertebrate community represent "good" conditions. The same stream is in "poor" condition before entering the Reservation from the south near the Town of Freedom.

The streams at these sites represent the reference conditions for all stream types on the Reservation. In 2002, qualitative or quantitative sampling will be conducted at approximately 30 invertebrate sites and mid-summer fish IBIs will be conducted at eleven sites.

### Setting/Land Use

The entire Reservation, covering approximately 64,500 acres, is in the Southeastern Wisconsin Till Plains ecoregion (Omernick 1987). At this time, the main sources of impairment are sedimentation (construction and agriculture) and nutrients (agriculture, suburban lawns, golf courses). The Reservation straddles the boundary of Brown and Outagamie Counties and includes all or portions of the City of Green Bay, Villages of Ashwaubenon and Howard, and the Towns of Hobart, Oneida and Pittsfield. Eleven additional municipalities rest within the watersheds flowing through the Reservation. All surface waters within the Oneida Reservation drain to the Great Lakes Basin (Lake Michigan). There are four separate surface water drainages, bearing numerous tributaries:

- 1) **Duck Creek River** – Fish Creek, Oneida Creek, Trout Creek, Lancaster Brook, Beaver Dam Creek, Silver Creek (*Lower Green Bay Basin*);
- 2) **South Branch of the Suamico River** (*Upper Green Bay Basin*);
- 3) **Ashwaubenon Creek** – North Branch, South Branch, Hemlock Creeks (*Fox River Basin*);
- and 4) **Dutchman Creek** (*Fox River Basin*)

Land use percentages surrounding the sites will be mapped this summer (2002), and the first formal biomonitoring report is being produced.

### Metrics and Biocriteria Development

While the Oneida Nation does not have federally approved water quality standards, the Tribe is implementing a water quality program with bioassessment surveys under tribal law. The inclusion of biocriteria into the Tribe's WQS has been delayed due to urgent water resource issues that have come up, rather than lack of information. The appropriate metrics to accurately predict responses in benthic invertebrate communities for the area are fairly well proven at this time. The metrics currently being used (for streams) are the Hilsenhoff Biotic Index (HBI), Taxa Richness, dominance, percent clingers and in some cases Ephemeroptera, Plecoptera and Trichoptera (EPT) and E, P and T taken separately. The most common impacts are due to sedimentation and organic loading. Because of the limited number and type of streams within the Reservation, it is believed that the appropriate reference sites to represent all of the stream types have been selected. A final designation of these has not been made, nor are biocriteria being submitted for inclusion in the WQS until there is a chance to conduct more sampling of test sites – compare with the reference sites.

## Documentation and Further Information

Personal communication (letter), James L. Snitgen, 1/2002.

Hard copies of documents including the Oneida Nation's WQS; SOPs for the Qualitative Sampling (#BI002) and Quantitative Sampling (#BI003) of Streams for Benthic Invertebrates; Annual Water Resources Report (future reports will contain fish and macroinvertebrate data)

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## Programmatic Elements

<b>Uses of bioassessment within overall water quality program</b>	<input checked="" type="checkbox"/>	problem identification (screening)
	<input checked="" type="checkbox"/>	nonpoint source assessments
	<input checked="" type="checkbox"/>	monitoring the effectiveness of BMPs
	<input checked="" type="checkbox"/>	ALU determinations/ambient monitoring
	<input type="checkbox"/>	promulgated into state water quality standards as biocriteria
	<input checked="" type="checkbox"/>	support of antidegradation
	<input type="checkbox"/>	evaluation of discharge permit conditions
	<input type="checkbox"/>	TMDL assessment and monitoring
<b>Applicable monitoring designs</b>	<input type="checkbox"/>	other:
	<input checked="" type="checkbox"/>	targeted (i.e., sites selected for specific purpose)
	<input checked="" type="checkbox"/>	fixed station (i.e., water quality monitoring stations)
	<input type="checkbox"/>	probabilistic by stream order/catchment area
	<input type="checkbox"/>	probabilistic by ecoregion, or statewide
	<input type="checkbox"/>	rotating basin
	<input type="checkbox"/>	other:

## Stream Miles

<b>Total miles</b>	<b>233</b>
Total perennial miles	—
<b>Total miles assessed for biology</b>	—
fully supporting for 305(b)	n/a
partially/non-supporting for 305(b)	n/a
listed for 303(d)	n/a
number of sites sampled ( <i>in summer 2002</i> )	41
number of miles assessed per site	~0.02 miles (25 meters)

## Aquatic Life Use (ALU) Designations and Decision-Making\*

<b>ALU designation basis</b>	Warm Water vs. Cold Water
<b>ALU designations in state water quality standards</b>	Two designations: cold water ecosystems, warm water ecosystems
<b>Narrative Biocriteria in WQS</b>	Inclusion of narrative and numeric biocriteria into the Tribe's WQS is under development, as is nutrient criteria. Tribal WQS include biological and water quality language but this does not constitute formal biocriteria.
<b>Numeric Biocriteria in WQS</b>	see above
<b>Uses of bioassessment data in integrated assessments with other environmental data (e.g., toxicity testing and chemical specific criteria)</b>	<input checked="" type="checkbox"/> assessment of aquatic resources <input checked="" type="checkbox"/> cause and effect determinations <input type="checkbox"/> permitted discharges <input checked="" type="checkbox"/> monitoring (e.g., improvements after mitigation) <input checked="" type="checkbox"/> watershed based management
<b>Uses of bioassessment/biocriteria in making management decisions regarding restoration of aquatic resources to a designated ALU</b>	Macroinvertebrate community data were used to designate one stream as a cold water resource. RBPs were conducted following a stormwater spill.

\*Water quality standards were federally approved in 1996 and then rescinded following a lawsuit.

## Reference Site/Condition Development

<b>Number of reference sites</b>	<b>4 total</b>
<b>Reference site determinations</b>	<input type="checkbox"/> site-specific <input type="checkbox"/> paired watershed <input type="checkbox"/> regional (aggregate of sites) <input checked="" type="checkbox"/> professional judgment ( <i>Qualitative data gathered initially on candidate reference sites. Most "pristine" of each stream type used as reference--still in early stages of determining all necessary reference sites</i> ) <input type="checkbox"/> other:
<b>Reference site criteria</b>	water quality, benthic invertebrate community (Hilsenhoff Biotic Index), land use, physical habitat, geomorphology, qualitative benthos investigations
<b>Characterization of reference sites within a regional context</b>	<input type="checkbox"/> historical conditions <input checked="" type="checkbox"/> least disturbed sites <input type="checkbox"/> gradient response <input type="checkbox"/> professional judgment <input type="checkbox"/> other:
<b>Stream stratification within regional reference conditions</b>	<input type="checkbox"/> ecoregions (or some aggregate) <input type="checkbox"/> elevation <input checked="" type="checkbox"/> stream type ( <i>all within Reservation/all in same ecoregion</i> ) <input type="checkbox"/> multivariate grouping <input type="checkbox"/> jurisdictional (i.e., statewide) <input type="checkbox"/> other:
<b>Additional information</b>	<input type="checkbox"/> UD reference sites linked to ALU <input type="checkbox"/> UD reference sites/condition referenced in water quality standards <input checked="" type="checkbox"/> some reference sites represent acceptable human-induced conditions

## Field and Lab Methods\*

<b>Assemblages assessed</b>	<input checked="" type="checkbox"/>	benthos (<100 samples per year; single season, multiple sites - broad coverage)
	<input checked="" type="checkbox"/>	fish (<100 samples per year; multiple seasons, multiple sites - broad coverage for watershed level)
	<input type="checkbox"/>	periphyton
	<input type="checkbox"/>	other:
<b>Benthos</b>		
sampling gear		Surber, D-frame, collect by hand; 500 micron mesh
habitat selection		riffle/run (cobble)
subsample size		300 count
taxonomy		species
<b>Fish</b>		
sampling gear		backpack electrofisher; 1/4" mesh
habitat selection		previously established monitoring sites and/or sites suitable for long term monitoring
sample processing		biomass - individual (identify and count)
subsample		none
taxonomy		species
<b>Habitat assessments</b>		visual based, quantitative measurements; performed with bioassessments
<b>Quality assurance program elements</b>		standard operating procedures, periodic meetings and training for biologists, sorting and taxonomic proficiency checks, specimen archival

\*The Oneida Nation has sampled fish for four years and began a macroinvertebrate program in 2001 using the RBP habitat rating score sheet. The Tribe's first herpetile survey is planned for summer 2002 to collect baseline data on two riverways and three wetlands. Oneida also plans to begin using macrophytes as indicators in wetlands.

## Data Analysis and Interpretation

<b>Data analysis tools and methods</b>	<input checked="" type="checkbox"/>	summary tables, illustrative graphs
	<input checked="" type="checkbox"/>	parametric ANOVAs
	<input type="checkbox"/>	multivariate analysis
	<input checked="" type="checkbox"/>	biological metrics ( <i>aggregate metrics into an index and return single metrics</i> )
	<input type="checkbox"/>	disturbance gradients
	<input type="checkbox"/>	other:
<b>Multimetric thresholds</b>		
transforming metrics into unitless scores		information not provided
defining impairment in a multimetric index		information not provided
<b>Evaluation of performance characteristics</b>	<input checked="" type="checkbox"/>	repeat sampling
	<input checked="" type="checkbox"/>	precision (replicates)
	<input type="checkbox"/>	sensitivity
	<input type="checkbox"/>	bias
	<input type="checkbox"/>	accuracy
<b>Biological data</b>		
Storage		Macroinvertebrate data in Corel Quattro Pro; fish data in MS Access
Retrieval and analysis		information not provided